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Tobacco Plant Bed

Preparation and Management

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A good tobacco crop is not possible unless it is started with good tobacco plants. If there is any one feature more essential to success in tobacco production than any other, it is probably the tobacco plant bed.

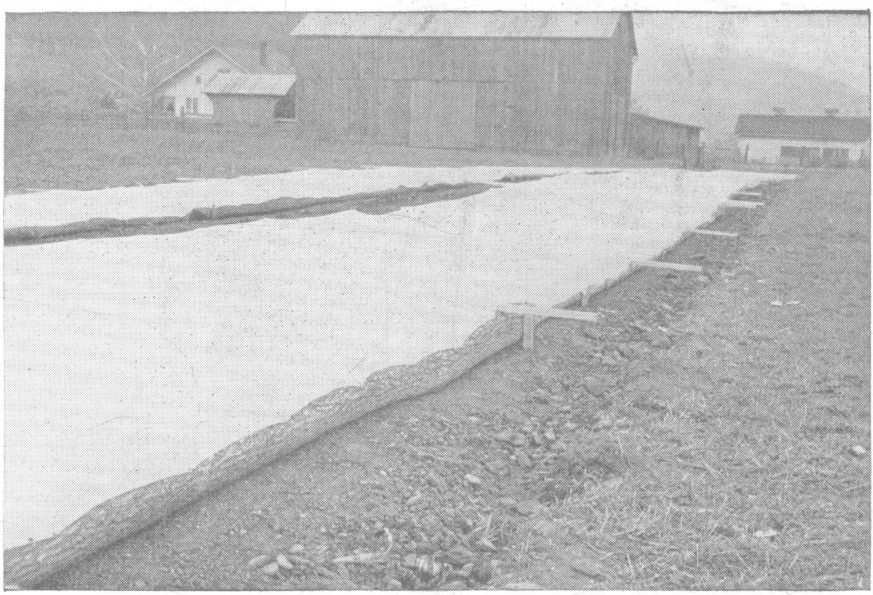

Fig. 1.—Tobacco plant beds are usually 9 feet wide and as long as the acreage to be set require. The bed should be completely covered with canvas, extending over the frame and fastened on the outside to permit no cracks.

Selection of Site.—The tobacco plant bed should be located on soil that is productive, well drained, and easy to work. The site should be free of shade; protected from severe cold, west winds; and preferably, should have a southern or eastern exposure. Where the plant bed soil is thoroughly sterilized, the same beds may be used year after year. However, if disease has been prevalent, a change of location is desirable.

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Size of Plant Beds.—Plant beds are usually 9 feet wide and as long as required to supply the plants needed. (See Fig. 1). In the White Burley tobacco section, it is customary to provide from 400 to 600 square feet of plant bed for each acre of field setting. This would be the equivalent of a bed 9 feet by 45 to 65 feet. In the cigar filler tobacco section, 200 square feet of bed frequently supplies the plants for an acre or more.

Variety to Plant.—There are a number of good tobacco varieties that produce well in isolated locations, but due to the prevalence of tobacco diseases and the heavy losses associated with the failure of a crop, it is

Fig. 2.—The result of selecting the wrong variety. Plants on left are of a root rot resistant variety while those to the right are of a non-resistant variety.

advisable in the White Burley section to use the newer more disease-resistant varieties, such as Kentucky 41A, Kentucky 16, and Kentucky 22. Where Fusarium wilt is prevalent, Kentucky 33 is desirable. (See Fig. 2). Kentucky 52 is probably the best variety where considerable mosaic is present. Kentucky 19, 56, and 34 are other varieties suitable to such situations. If a Warner type of tobacco is desired, Kentucky 24 is suggested. Other varieties known by name instead of number are more subject to disease. Where they are used, the same land should not be put in tobacco more frequently than once in every 8 to 10 years.

Amount of Seed.—Growers differ considerably in the amount of seed they use. A desirable rate of seeding in the White Burley tobacco area is 1 teaspoonful for each 300 to 500 square feet of plant bed. In the cigar filler tobacco section, a somewhat heavier rate of seeding per 100 square feet of bed is ordinarily used and the size of bed per acre of field planting is considerably less.

Soil Preparation.—The soil preparation of the plant bed should be made early. Where organic materials, such as manure or cut-up corn stalks

or peat moss, are used to improve the physical condition and productiveness of the soil, they should be applied in advance and thoroughly worked in, in connection with the preparation of the soil before fertilization. As a final step in this soil preparation, the bed should be slightly ridged in the center to insure good drainage but otherwise should be left smooth and even so as to require a minimum of raking after sterilization.

Sterilization of the Soil.—Whether the plant bed is in an old location or a new one, it is always advisable to sterilize the soil. There are three good means by which this may be done. The first is by inverting a metal pan and feeding steam under this for 20 to 25 minutes with a pressure of 125 to 150 pounds. This method has for some years been the common practice in the cigar filler section of the Miami Valley. A second method, commonly used in the White Burley section, is burning. For this purpose, brush, slabs, logs, or other forms of wood are used. One practice is to pile such fuel uniformly over the plant bed and then burn it completely where it is (See Fig. 3). A second procedure is to build the fire on a section of

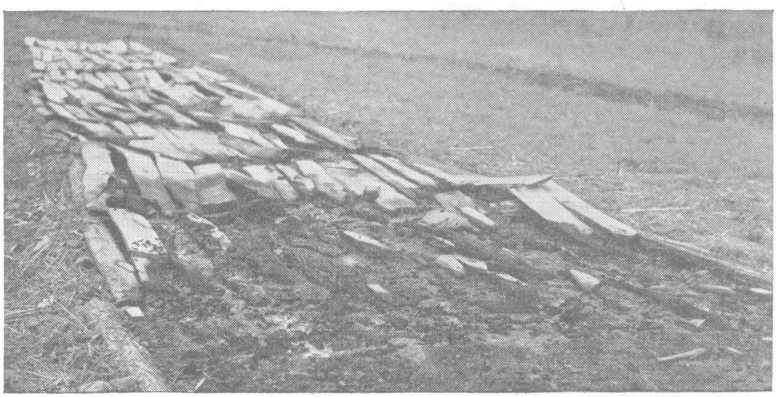

Fig. 3.—Slabs, logs, brush, or other wood may be piled on the prepared plant bed and burned as a means of sterilization. In this case, insufficient fuel was provided.

woven wire fence on one end of the bed. After that area has been fired sufficiently to give thorough sterilization, pull the section of woven wire forward by means of a chain and horse, tractor, or man-power. Thus, the process is repeated until the complete bed has been thoroughly sterilized. The greatest difficulty with this method is that a great deal of fuel is required and too frequently the bed is not sufficiently sterilized. The fire should be kept at one location sufficiently long to give thorough sterilization to a depth of 3 or 4 inches. Other types of fuel can be used if properly handled.

The third means of sterilization is by use of chemicals, cyanamid and uramon are the ones in common use. While these have given excellent results in some of the southern states, tests with syanamid in Kentucky have not always been satisfactory. A good many trials have now been made in Ohio, including work at the Southwestern Experiment Farm, with very satisfactory results. In the Ohio tests, cyanamid only has been used. Where

chemicals are used for sterilization, the operation must begin in the fall and the chemicals must be applied on or before October 15. Otherwise, cold winter weather may retard chemical action and the chemicals may still be exerting a sterilizing effect at tobacco seeding time, thus killing the tobacco seed. It appears that there should be at least 60 and preferably 90 days between the applying of the chemicals and severe winter freezing of the soil.

The standard process where cyanamid is the material used is as follows: (a) Clean all grass and weeds from the area surrounding the plant bed for a distance of from 10 to 15 feet, in order to prevent the re-introduction

Fig. 4.—Two tobacco fields photographed on the same day. The one at the top reflects the results of proper preparation and management of the tobacco bed.

of weed seed. (b) Broadcast ½ pound granular cyanamid per square yard before preparation of the soil is begun. Plow or work this into the soil to a depth of 6 inches and smooth the ground. (c) Broadcast another ¾ pound of cyanamid per square yard over this smoothed soil and work it in as deeply and thoroughly as possible. It is important that this be evenly and thoroughly distributed through the soil. Complete the working by leaving the soil smooth and higher in the center of the bed than along the outside in order to provide good drainage and encourage more rapid chemical

action. (d) Apply another ¼ pound of cyanamid and work this in lightly with a hand rake. (e) Cover the bed with some *weed-seed-free mulch,* such as corn stalks, straw, or leaves, to conserve moisture and keep the soil in a better physical condition and to make it easier to complete seed bed preparation in the spring. (f) At seeding time, sometime in March, remove the mulch but stir the soil as lightly as possible. *Deep working may bring up unkilled weed seeds.* (g) The best time for treating with cyanamid is as soon after a fall rain as soil conditions will permit. If the ground is dry when treated and no prospects of rain, 5 gallons of water should be applied to each 100 square feet after mulching in order to speed up chemical action.

Fertilization.—Where chemical nitrogen (cyanamid) has been used for fertilization, the fertilizer used at seeding time should be one low in nitrogen, such as 2-12-6, 3-12-12, or a 4-12-8 with a part or all of the potash in the

Fig. 5.—Weeding a tobacco bed. The poor stand of weak, slow-growing tobacco plants and the many weeds are the product of neglect of plant bed sterilization and other essentials of good plant production.

sulfate form. It should be used at the rate of 2 to 4 pounds per 100 square feet. Where the bed has been heavily burned, the ashes supply an abundance of potash and the fertilizer may then be 1.5 pounds of nitrate of soda and 2 pounds of 20 per cent superphosphate per 100 square feet of bed. Under other conditions, the fertilizer should be an 8-8-8 or a 4-12-8 at the rate of 3 to 5 pounds per 100 square feet and with a part or all of the potash in the sulfate form. The fertilizer should be worked in lightly, not more than an inch. (See Fig. 4).

Seeding.—An even distribution of seed is essential to a uniform stand. In order to accomplish this, the teaspoonful of seed intended for 300 to 500 square feet of plant bed in the White Burley area or a somewhat smaller area in the cigar filler district, should be mixed with a gallon or more of ashes, fertilizer, fine sand, or fine soil and then distributed uniformly by going over the area two or more times in different directions. Another method developed at the Southwestern Experiment Farm is to germinate

the seed before putting it in the bed. This is done by putting the seed in a muslin cloth and suspending it in a glass fruit jar about an inch above the water for 3 days. The germinated seed is then put in water and applied through a sprinkling can. The water in the can must be kept agitated to prevent the seeds settling to the bottom. This will produce plants ready to set 5 or 6 days earlier.

Tamping.—The seed needs no covering except such as results from tamping, rolling, or tramping till the surface is firm enough to permit stepping on it without leaving an impression in the soil. Such tamping, however, must not be applied to wet ground.

Covering.—The next operation is to enclose the bed completely, such as by 1 by 6-inch boards on the edge around the bed to serve as a frame and

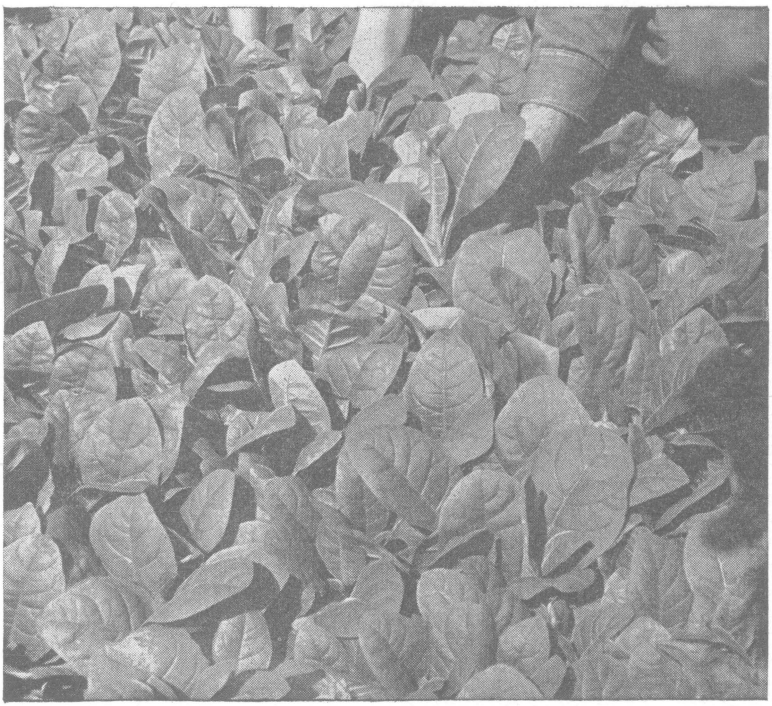

Fig. 6.—A uniform stand of large, healthy, rapidly growing tobacco plants, the product of careful attention to all phases of plant bed preparation and management.

good canvas over the top. There must be no open cracks at corners or joints. The canvas should come out over the top of the board and fasten on the outside so as to permit no cracks between canvas and board. Logs or poles may, with care, be used in the same manner as boards for frame material. (See Fig. 1).

Some growers use a ridge of soil in place of the boards or poles around the bed or permit the canvas to rest on the surface of the bed, but this is not recommended.

Watering.—Unless a rain is in prospect when seeding is completed, the bed should be watered through the canvas with from 50 to 60 gallons of water per 100 square feet. This should be repeated every 4 to 6 days unless rendered unnecessary by rains.

Nitrating.—If plants become yellow or are making unsatisfactory growth, 1 pound of nitrate of soda dissolved in 5 gallons of water should be sprinkled over each 200 square feet. Immediately following this, clear water should be sprinkled in a like amount in order to wash the nitrate solution from the plants. If the bed is already overly wet, the pound of

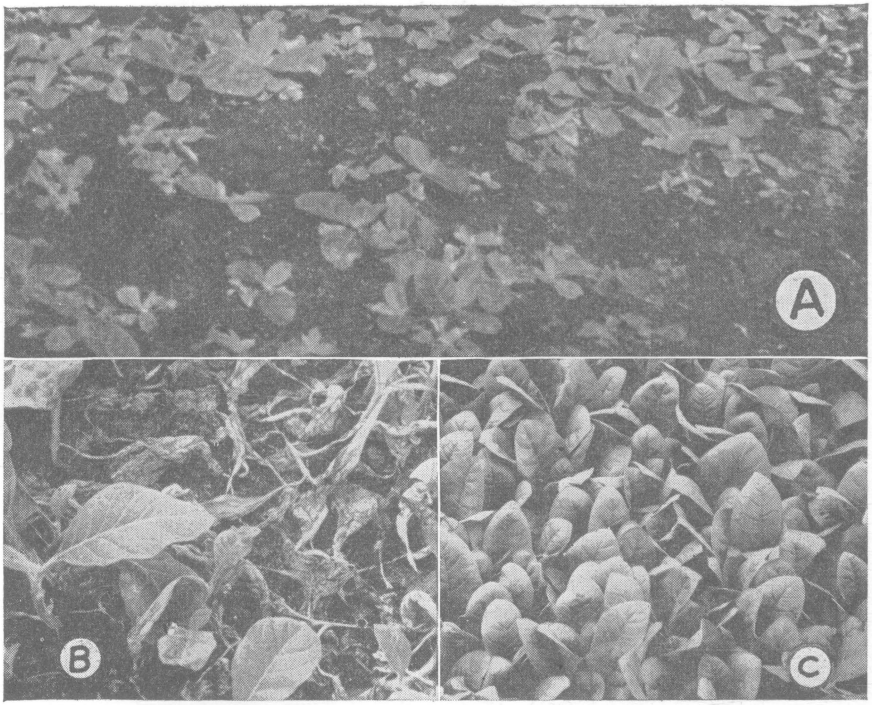

Fig. 7.—A. The effect of blue mold infection on stand and vigor of plants in a tobacco bed. B. A close-up showing the scalded and killing effect of blue mold on tobacco plants. C. Healthy, vigorous stand of tobacco plants in a plant bed that has been treated with a fungicide for blue mold control.

nitrate of soda can be mixed with a half bushel of dry, well rotted manure or peat, let set for 24 to 48 hours, or until the nitrogen material has been absorbed, and then spread evenly over the 200 square feet.

Wildfire and Angular Leaf Spot.—When plants are the size of a dime, apply by a sprinkling can through the canvas at the rate of 1 quart per square yard, a 3-4-50 bluestone-lime mixture (3 pounds copper sulfate, commonly called bluestone, 4 pounds hydrated lime, and 50 gallons of water). Applications should be made at weekly intervals.

Mosaic.—Mosaic is spread by the hands and clothing of workmen. It can be controlled by seeing that no tobacco is chewed, smoked, handled,

or carried in the pockets of men working with the plant bed. All mosaic infected plans should be rogued out of the plant bed.

Blue Mold.—Blue mold moves north each year. The probability of trouble is known in advance by pathologists and county agents through reports from farther south. It should be prevented by the use of "Fermate" or other similar products on the plant bed before the attack occurs. (See Fig. 7). For the control of blue mold, Fermate should be used at the rate of 3 pounds in 100 gallons of spray (1½ in 50) applied at the rate of 5 to 6 gallons per 150 square yards or as a dust of 7½ pounds with 42 pounds of inert material such as talc or Pyrax.

Uncover the beds during wet or humid conditions and aerate as much as possible during daylight hours. Re-cover each night.

Flea Beetles.—These and some other leaf insects may be controlled by dusting with rotenone under the canvas.

Cutworms.—For control of cutworms, scatter thinly over the bed in the early evening, a bran mash made by mixing 1 pound of Paris green and 25 pounds of bran and a little sirup and water enough to make a crumbly product.

By careful attention to all these phases of plant production, strong healthy plants may be produced and a profitable crop may be half realized before the plants are set. (See Figs. 5 and 6).

For more dtailed suggestions on the various operations of the tobacco plant bed and later field production, see your county agricultural agent.